

## CLAIMS

1. A radiation detector that detects how first radiation and second radiation are spatially distributed, comprising:

a plurality of optical transducers each of which converts the first radiation incident, to light having a first wavelength, and converts the second radiation to light having a second wavelength;

a shielding unit that is arranged between two of the optical transducers to prevent passing of the first radiation, the second radiation, and the light obtained by the optical transducer;

a plurality of first photoelectric converters that are arranged along the optical transducers in a one-to-one correspondence, and that output electrical signals according to the intensity of the light having the first wavelength; and

a plurality of second photoelectric converters that are arranged along the optical transducers in a one-to-one correspondence, and that output electrical signals according to the intensity of the light having the first wavelength.

2. The radiation detector according to claim 1, wherein the first radiation is  $\gamma$ -rays, and

the first photoelectric converter includes a photomultiplier.

3. The radiation detector according to claim 1, wherein the second radiation is X-rays, and

the second photoelectric converter includes a photodiode.

4. The radiation detector according to claim 1, wherein  
the first photoelectric converter is arranged on downstream of  
the optical transducer in an advance direction of the first radiation and  
5 the second radiation, and  
the second photoelectric converter is arranged on a side plane  
of the optical transducer in the advance direction of the first radiation  
and the second radiation.
- 10 5. The radiation detector according to claim 4, wherein  
the optical transducer includes a scintillator array with  
scintillators that are one-dimensionally arranged, and  
the second photoelectric converter includes a photodiode array  
with photodiodes that are one-dimensionally arranged on a side plane  
15 of the scintillator array in the advance direction of the first radiation and  
the second radiation so that the photodiodes correspond to the  
scintillators, respectively.
6. The radiation detector according to claim 5, wherein the  
20 photodiode array includes a wiring structure extended from the  
photodiodes to the downstream in the advance direction of the first  
radiation and the second radiation.
7. The radiation detector according to claim 5, wherein the  
25 photodiode array includes a wiring structure extended from the

photodiodes to the downstream in the advance direction of the first radiation and the second radiation, and further extended along an array direction of the photodiodes.

- 5    8.        The radiation detector according to claim 5, wherein the scintillator array and the photodiode array are arranged in plural numbers in a direction perpendicular to the array direction of the scintillators.
- 10   9.        The radiation detector according to claim 1, wherein  
              the first photoelectric converter is arranged on the downstream of the optical transducer in an incident direction of the first radiation and the second radiation, and  
              the second photoelectric converter includes an element that  
15   passes the first radiation and the second radiation, and is arranged on upstream of the optical transducer in the incident direction of the first radiation and the second radiation.